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EXAMINER

CHANG, EDITH M

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 01/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/590,657

Applicant(s)

BOMBAY ET AL

Examiner

Edith M Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8, 9, 12-14 and 16-18 is/are rejected.
- 7) ☒ Claim(s) 7, 10, 11, 15, 19 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claim 1 and its dependent claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

2. Claims 7, 10, 15, 17, & 19 are objected to because of the following informalities:

Claims 7, 10, 15 and 19, add the "< > is the complex scalar product" in the claim as the < > first appears in these dependent claims.

Claim 17, it appears that the term "the first second set of samples" in line 2 should be changed to "the second set of samples". Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3-4, 6, & 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyon et al. (US 5838727) in view of Goodman et al. (US 5473321).

Regarding **claim 1**, except explicitly specify the cancellation logic for the different channels/propagation modes, Lyon et al. discloses all subject matter: a digital telemetry system (FIG. 1), comprising: a data transmission cable having a first end and a second end (14 FIG. 1), and capable of transmitting data on at least two propagation modes (FIG. 9, column 3 lines 50-55, column 12 line 65-column 13 line 10); a data source connected at the first end and having data transmission circuitry (10 FIG. 1, column 4 line 1-5, FIG. 2); a receiver connected to the second end whereon the receiver receives signals on a first and second of at least two propagation modes (12 FIG. 1, column 4 lines 1-10, FIG. 2) and having a processor executing instructions for receiving correct signals that occurs between the first and second propagation (FIG. 2, 10 is the transmitter processor, 12 is the receiver processor). However Goodman et al. teaches the cancellation logic (column 2 lines 25-35 where is the cross-talk, column 2 lines 35-50 where is cancellation of the cross-talk, 505a FIG. 5). As the Lyon et al.'s system using two channels/propagation modes in the high speed data rate in order to receive the correct signals without interference (column 3 lines 20-25), at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the cancellation logic for each propagation mode taught by Goodman et al. in Lyon et al.'s receiver (44 FIG. 2) to provide less complicated and more reliable arrangement to assure accurately reception of data signals from sonde (column 12 lines 35-55, column 5 lines 5-10).

Regarding **claim 3**, Lyon et al. does not teach the slice residual, however Goodman et al. teaches determining a slice residual and updating a cross-talk parameter (512-510 FIG. 5). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the determining slice residual and updating a parameter taught by Goodman in Lyon et al.'s

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receiver to assure accurately reception of data signals from sonde (column 12 lines 35-55, column 5 lines 5-10).

Regarding **claim 4**, Lyon et al. does specify the frequency/carrier of propagation modes (column 2 lines 14-20), and Goodman et al. teaches the adaptive cross-talk cancellation logic causes the processor to accepts as input one value on each of a plurality of carries and to computes the cross-talk component for each carrier (column 2 lines 37-35, column 3 lines 15-25, FIG.2, FIG.5, wherein the digital filter accepts input one value on each of a plurality of carries and do the computation). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Goodman et al.'s teaching in Lyon et al.'s receiver. This modified system discloses limitations cited in the claim and assures accurately reception of data signals from sonde (column 12 lines 35-55, column 5 lines 5-10).

Regarding **claim 6**, Lyon et al. does not explicitly specify the cross-talk parameter update logic, however Goodman et al. teaches the cross-talk parameter update logic updates each carrier specific coefficient as a function of the slice residual on such carrier (column 2 lines 37-35, column 3 lines 15-25, FIG.2, FIG.5). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Goodman et al.'s teaching in Lyon et al.'s receiver to assure accurately reception of data signals from sonde (column 12 lines 35-55, column 5 lines 5-10).

Regarding **claim 8**, Lyon et al. does not explicitly specify the digital cross-talk adjustment circuit, however Goodman et al. teaches the cross-talk adjustment circuit receives m samples from the second receive circuitry and convolves these using m coefficients (column 6 lines 50-52) and the slice determination logic and coefficient update logic wherein the m

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coefficients are adjusted as a function of a slice residual determined by the slice determination logic (510, 512 FIG.5, column 6 lines 40-52, where the digital filter receives samples and has coefficients/taps to be updated). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Goodman et al.'s teaching in Lyon et al.'s receiver to assure accurately reception of data signals from sonde (column 12 lines 35-55, column 5 lines 5-10).

Regarding **claim 9**, Lyon et al. does not teach the instructions of slice determination logic and coefficient update logic, however Goodman et al. teaches the instructions of slice determination logic and a coefficient update logic stored in the storage medium of a DSP (column 7 lines 22-27). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the instructions slice determination logic and a coefficient update logic stored in the storage medium of a DSP taught by Goodman et al. in Lyon et al.'s receiver to provide less complicated and more reliable arrangement to assure accurately reception of data signals from sonde (column 12 lines 35-55, column 5 lines 5-10).

5. Claims 2, & 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyon et al. (US 5838727) in view of Goodman et al. (US 5473321) as applied to claim 1 above, and further in view of Hjelm et al. (US Patent 6647067).

Regarding **claim 2**, further Hjelm et al. teaches the crosstalk cancellation that removes crosstalk interference from received signals on a given line by estimating the interference induced by other lines and using the estimation to cancel the crosstalk (Abstract; FIG.2 & 3, column 5 lines 55-61, where the far cross talk is handled). At the time of the invention, it would

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have been obvious to a person of ordinary skill in the art to have the crosstalk cancellation taught by Hjelm et al. in Goodman et al.'s filter equalizer to have a more efficient crosstalk cancellation to reduce the crosstalk (column 2 lines 45-55, less computation power and fast rate) as cited in the claim that the first propagation mode cross-talk adjustment circuit adjusting the samples on the first propagation mode by values that are a function of the samples of the second propagation mode.

Regarding **claim 5**, further Hjelm et al. teaches the cross-talk cancellation method and its circuitry computes the cross-talk component for each carrier by multiplying the signal received on the second propagation mode by a carrier specific coefficient (FIG. 2 & 3, column 6 lines 25-35). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the crosstalk cancellation taught by Hjelm et al. in Goodman et al.'s filter equalizer to reduce the crosstalk for a more efficient crosstalk cancellation to reduce the crosstalk (column 2 lines 45-55, less computation power and fast rate).

6. Claims 12-14, & 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyon et al. (US 5838727) in view of Goodman et al. (US 5473321) and Hjelm et al. (US Patent 6647067).

Regarding **claims 12 & 16**, Lyon et al. discloses a method comprising: inputting a first sample received on a first propagation mode; imputing a second sample received on a second propagation mode (column 12 line 65-column13 line 10), but does not explicitly specify the cross-talk component and its method. However Goodman et al. teaches the cross-talk component (column 2 lines 25-35, 505a FIG.5) and Hjelm et al. teaches the cancellation method of using

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cross-talk component (Abstract, column 2 line 56-column 3 line 5, wherein subtracting the cross-talk component determined from one line/channel/propagation mode from another line/channel/propagation mode). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the method taught by Hjelm et al. implemented by the cross-talk component taught by Goodman et al. in each channel/propagation mode of Lyon et al.'s receiver to provide an efficient crosstalk cancellation processing (column 2 lines 45-55), less complicated and more reliable arrangement to assure accurately reception of data signals from sonde (column 12 lines 35-55, column 5 lines 5-10 '321).

Regarding **claims 13 & 18**, Lyon et al. does not teach the slice residual, however Goodman et al. teaches determining a slice residual and adjusting a function used to determine the cross-talk component (512-510 FIG.5). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the determining slice residual and updating a parameter taught by Goodman in Lyon et al.'s receiver to assure accurately reception of data signals from sonde (column 12 lines 35-55, column 5 lines 5-10).

Regarding **claims 14 & 17**, Lyon et al. does not explicitly specify the multiplying a carrier specific coefficient in the cross-talk component determination, however Goodman et al. teaches the cross-talk component is determined by multiplying a carrier specific coefficient with a sample received (507-510 FIG.5, column 6 lines 40-52). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the teaching of the cross-talk component determined by multiplying a carrier specific coefficient with a sample received taught by Goodman et al. in Lyon et al.'s receiver to assure accurately reception of data signals from sonde (column 12 lines 35-55, column 5 lines 5-10).

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Allowable Subject Matter

7. Claims 7, 10-11, 15, 19-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and rewritten to overcome the claim objections in paragraph 2 of this office action.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 703-305-3416. The examiner can normally be reached on M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4800.

Edith Chang
December 24, 2003

A handwritten signature in black ink, appearing to read "Chieh M. Fan", with a stylized flourish at the end.

**CHIEH M. FAN
PRIMARY EXAMINER**